REMARKS

The Office Action mailed May 2, 2007 has been carefully considered. Reconsideration in view of the following remarks is respectfully requested.

Claim Status and Amendment to the Claims

Claims 1-206 are currently pending. No claims stand allowed.

Claims 1, 17, 21, 25, 32, 40, 45, 61, 65, 69, 76, 120, 84, 89, 105, 109, 128, 133, 146, 147, 155, 165, 178, 179, and 187 have been amended to further particularly point out and distinctly claim subject matter regarded as the invention. Support for these changes may be found in the specification and figures as originally filed. The text of claims 2-9, 22-24, 26, 27, 33-35, 41-43, 46-53, 66-68, 70, 71, 77-79, 85-87, 90-97, 110-112, 121-123, 129-131, 134-141, 148-150, 156-158, 166-173, 180-182, and 188-190 is unchanged, but their meaning is changed because they depend from amended claims.

Claims 10-12, 29-31, 54-56, 73-75, 98-100, and 117-119 have been cancelled without prejudice or disclaimer of the subject matter therein.

The 35 U.S.C. § 101 Rejection

Claims 25-27, and 69-71 stand rejected under 35 U.S.C. § 101, as allegedly claiming non-statutory subject matter.[1] With this Amendment, independent claims 25 and 69 have been amended to recite in part presenting a result of said comparing to a user of said wireless user device. The amendments to Claims 25 and 69 find support in the Specification and Figures as originally filed. Accordingly, withdrawal of the 35 U.S.C. § 101 rejection is respectfully requested.

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[1] Office Action mailed May 2, 2007, at ¶ 7.

Claims 26, 27, 70, and 71

Claims 26 and 27 depend from Claim 25. Claims 70 and 71 depend from Claim 69.

Claims 25 and 69 being allowable, Claims 26, 27, 70, and 71 must also be allowable for at least

the same reasons as Claims 25 and 69.

The First 35 U.S.C. § 103 Rejection

Claims 1, 2, 10, 13, 16-18, 21, 24-29, 32, 35-37, 40, 43, 45, 46, 54, 57, 60-62, 65, 68-73,

76, 79-81, 84, 87-90, 98, 101, 104, 105, 106, 109, 112, 114-117, 120, 123-125, 128, 131, 133,

134, 142, 145-147, 150-156, 159, 160, 163, 165, 166, 174, 177-179, 182, 183-187, 190-192, and

195 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over $\underline{Li}^2$ in view of

$\underline{Welch}$,[3] among which claims 1, 2, 10, 13, 17, 18, 21, 25, 28, 29, 32, 36, 37, 40, 45, 54, 57, 61,

62, 65, 69, 73, 76, 80, 84, 88, 89, 90, 98, 101, 105, 106, 109, 116, 117, 120, 124, 125, 128, 133,

142, 146, 147, 151, 159, 160, 163, 165, 174, 178, 179, 183, 186, 187, 191, and 192 are

independent claims.[4]

> According to the Manual of Patent Examining Procedure (M.P.E.P.),
>
> To establish a *prima facie* case of obviousness, three basic criteria must be met. First there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the applicant's disclosure.[5]

Claim 1

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[2] U.S. Patent No. 5,774,588 to $\underline{Li}$.
[3] U.S. Publication No. 2004/0097246 to $\underline{Welch}$.
[4] Office Action at ¶ 9.

With this Amendment, Claim 1 has been amended to recite in part for *each* of said one or more candidate keyword strings, creating a *single* bit vector based at least in part on said each of said one or more candidate keyword strings, said bit vector for use in comparing an input bit vector with said bit vector to indicate whether an input keyword string represented by said input bit vector matches said one or more candidate keyword strings, said input keyword string provided by a user of said wireless user device. (emphasis added) Whereas, as indicated by the Examiner, Li discloses partitioning a signature vector into *seven* groups of 12 bits each, translating each of the seven 12-bit binary numbers into decimal numbers which are used to create a bucket address table. And rather than storing the one or more bit vectors as required by Claim 1, Li discloses storing pointers to lexicon entries in the bucket address table. The Applicants respectfully submits it is improper to equate storing a single bit vector that is based at least in part on a candidate keyword string, with storing pointers to lexicon entries in a bucket address table as proposed by the Examiner.

Claim 2

Claim 2 depends from Claim 1. Claim 1 being allowable, Claim 2 must also be allowable.

Claim 10

With this Amendment, Claim 10 has been cancelled without prejudice or disclaimer, rendering the rejection of Claim 10 moot.

Claim 13

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[5] M.P.E.P § 2143.

With this Amendment, Claim 13 has been amended to recite in part creating a *single* bit vector based at least in part on said input keyword string. (emphasis added) Thus, the arguments made with respect to Claim 1 apply here as well. Claim 1 being allowable, Claim 13 must also be allowable.

Claim 16

Claim 16 depends from Claim 13. Claim 13 being allowable, Claim 16 must also be allowable.

Claim 17

With this Amendment, Claim 17 has been amended to recite in part for *each* of said one or more candidate keyword strings, creating a *single* bit vector based at least in part on said each of said one or more candidate keyword strings, said bit vector for use in comparing an input bit vector with said bit vector to indicate whether an input keyword string represented by said input bit vector matches said one or more candidate keyword strings, said input keyword string provided by a user of said wireless user device. (emphasis added) Thus, the arguments made above with respect to Claim 1 apply here as well. Claim 1 being allowable, Claim 17 must also be allowable.

Claim 18

The arguments made with respect to Claim 17 apply here as well.

Claim 21

With this Amendment, Claim 21 has been amended to recite in part creating a *single* bit vector based at least in part on said input keyword string. (emphasis added) Thus, the arguments made with respect to Claim 1 apply here as well. Claim 1 being allowable, Claim 21 must also be allowable.

Claim 24

Claim 24 depends from Claim 21. Claim 21 being allowable, Claim 24 must also be allowable.

Claim 25

Claim 25 recites:

A method for comparing keyword strings on a wireless user device, the method comprising:
determining a relative frequency of use for at least one symbol in a language;
assigning a statistical weighting to said at least one symbol based at least in part on a relative frequency of use of said at least one symbol;
assigning each of said at least one symbol to one of a plurality of groups; and
comparing a first keyword string and a second keyword string based at least in part on whether at least one symbol of said first keyword string is assigned to the same group as at least one corresponding symbol of said second keyword string.

The Examiner states:

... Welch in view of Li is directed to "a method for comparing keyword strings on a wireless user device" (Welch, Paragraph 0026, i.e., In further embodiments, the broadcast media receiver 10 and/or the wireless terminal 20 are configured to determine whether one or more keywords or other criteria are present in the textual data; Figure 1: 20) and teaches the limitations: "determining a relative frequency of use for at least one symbol in a language (Li, Column 7 Line 4-40, i.e. "frequency table"); "assigning a statistical weighting" (A counter is accumulated ...) "to said at least one symbol based at least in part on a relative frequency of use of said at least one symbol" (Li, Column 7 Line 4-40); "assigning each of said at least one symbol to one of a plurality of groups" (Li, Column 7 Line 4-40, "first group"); and "comparing a first keyword string and a second keyword string based at least in part on whether at least one symbol of said first keyword string is assigned to the same group as at least one corresponding symbol

of said second keyword string" (Li, Column 8 Line 51 through Column 9 Line 36).[6]

The Applicant respectfully disagrees. In the Response filed March 19, 2007, the Applicant argued that contrary to the Examiner's statement, the cited references do not disclose or suggest determining a relative frequency of use for at least one symbol in a language. In the Office Action mailed May 2, 2007, the Examiner does not address the merits of Applicant's argument. In support of the Examiner's contention, the Examiner refers to portions of Li that disclose accumulating a counter for each of 85 bits in a signature vector based on the presence of particular bi-grams in lexicon strings. A bi-gram vector based on the English language alphabet would have bits representing the character *combinations* AA, AB, AC, AD . . . ZW, ZX, ZY, ZZ, for a total of 676 entries.[7] The Applicant respectfully submits that the Examiner's attempt to equate a symbol in Claim 25 with a bi-gram disclosed by Li is improper, as the bi-gram of Li is a *combination* of characters. Thus, Li discloses determining the frequency of a combination of characters; Li does not disclose determining a relative frequency of use for at least one *symbol* in a language. For this reason, the 35 U.S.C. § 103(a) rejection of Claim 25 based on Li in view of Welch is unsupported by the art.

Additionally, since Li does not disclose determining a relative frequency of use for at least one symbol in a language, Li cannot teach assigning a statistical weighting to said at least one symbol based at least in part on a relative frequency of use of said at least one symbol as required by Claim 25. For this additional reason, the 35 U.S.C. § 103(a) rejection of Claim 25 based on Li in view of Welch is unsupported by the art.

And since Li discloses analysis based on *bi-grams*, Li cannot be said to disclose assigning each of said at least one *symbol* to one of a plurality of groups. For this additional reason, the 35

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[6] Office Action, at pp. 18-19.
[7] Li at col. 2 ll. 3-6.

U.S.C. § 103(a) rejection of Claim 25 based on <u>Li</u> in view of <u>Welch</u> is unsupported by the art.

Thus, a prima facie case of obviousness has not been established and the rejection must be

withdrawn.

<u>Claim 26</u>

Claim 26 recites:

> The method of claim 25 wherein said assigning further comprises assigning each
> of said at least one symbol to one of a plurality of groups so as to minimize
> the difference between the sums of statistical weightings for symbols
> comprising each group in said plurality of groups.

The Examiner states:

> ... Welch in view of Li is directed to the method of claim 25 and teaches the
> limitations: "wherein said assigning further comprises assigning each of said at
> least one symbol to one of a plurality of groups so as to minimize the difference
> between the sums of statistical weightings for symbols comprising each group in
> said plurality of groups" (Li, Column 7 Line 4-40, groups).[8]

The Applicant respectfully disagrees. Contrary to the Examiner's statement, the cited references

do not disclose or suggest wherein said assigning further comprises assigning each of said at least

one symbol to one of a plurality of groups so as to minimize the difference between the sums of

statistical weightings for symbols comprising each group in said plurality of groups. In support

of the Examiner's contention, the Examiner refers to a portion of <u>Li</u> that discloses partitioning a

signature vector into seven groups. But the disclosure in <u>Li</u> refers to *bi-grams*. Bi-grams are not

"at least one symbol in a language" as required by the claim. And the frequencies disclosed in <u>Li</u>

are frequencies of bi-grams, not frequencies of symbols in a language. For this additional reason,

the 35 U.S.C. § 103(a) rejection of Claim 26 based on <u>Li</u> in view of <u>Welch</u> is unsupported by the

art. Thus, a prima facie case of obviousness has not been established and the rejection must be

withdrawn.

Claim 27

Claim 27 recites:

> The method of claim 25 wherein said relative frequency of use comprises the
> relative frequency of use of symbols in the first character of words in said
> language.

The Examiner states:

> ... Welch in view of Li is directed to the method of claim 25 and teaches the
> limitation: "wherein said relative frequency of use comprises the relative
> frequency of use of symbols in the first character of words in said language" (Li,
> Column 7 Line 4-40).[9]

The Applicant respectfully disagrees. In the Response filed March 19, 2007, the Applicant

argued that contrary to the Examiner's statement, the cited references do not disclose or suggest

wherein said relative frequency of use comprises the relative frequency of use of symbols in the

first character of words in said language. In the Office Action mailed May 2, 2007, the Examiner

does not address the merits of Applicant's argument. Contrary to the Examiner's statement, the

cited references do not disclose or suggest wherein said relative frequency of use comprises the

relative frequency of use of symbols in the first character of words in said language. In support

of the Examiner's contention, the Examiner refers to a portion of Li that discloses partitioning a

signature vector into seven groups. But the disclosure in Li refers to bi-grams. And since Li

describes a bi-gram as two characters, Li cannot disclose the limitations of Claim 27 because the

result would be nonsensical. Substituting "bi-grams" for "symbols," the claim limitation reads

"wherein said relative frequency of use comprises the relative frequency of bi-grams in the first

character of words in said language," requiring the determination of the relative frequency of

two-character sequences in *a* character. For this additional reason, the 35 U.S.C. § 103(a)

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[8] Office Action, at p. 19.
[9] Office Action, at p. 19.

rejection of Claim 27 based on <u>Li</u> in view of <u>Welch</u> is unsupported by the art. Thus, a prima

facie case of obviousness has not been established and the rejection must be withdrawn.

Claim 28

Claim 28 recites:

A method for creating a keyword string database on a wireless user device, the
method comprising:
determining one or more candidate keyword strings to store in said database;
creating one or more bit vectors based at least in part on said one or more
candidate keyword strings, each bit of said one or more bit vectors
corresponding to one or more symbols in an alphabet, bits having a bit
position corresponding to the first symbol of a word in said one or more
candidate keyword strings being set, said one or more bit vectors for use in
comparing an input bit vector with said one or more bit vectors to indicate
whether an input keyword string represented by said input bit vector matches
said one or more candidate keyword strings; and
storing said one or more bit vectors and a reference to said one or more candidate
keyword strings in said database.

The Examiner states:

... Welch in view of Li is directed to "a method for creating a keyword string
database on a wireless user device" (Welch, Paragraph 0026, i.e., In further
embodiments, the broadcast media receiver 10 and/or the wireless terminal 20 are
configured to determine whether one or more keywords or other criteria are
present in the textual data; Figure 1: 20), and teaches the limitations:
"determining one or more candidate keyword strings to store in said database (Li,
Column 6 Line 40-50, i.e., valid lexicon strings (such as legal and correct city
names).....); "creating one or more bit vectors based at least in part on said one or
more candidate keyword strings" (Li, Column 6 Line 40 through Column 9 Line
35), "each bit of said one or more bit vectors corresponding to one or more
symbols in an alphabet, bits having a bit position corresponding to the first
symbol of a word in said one or more candidate keyword strings being set" (Li,
Column 6 Line 40 through Column 9 Line 35), "said one or more bit vectors for
use in comparing an input bit vector with said one or more bit vectors to indicate
whether an input keyword string represented by said input bit vector matches said
one or more candidate keyword strings" (Li, Column 8 Line 51 through Column 9
Line 36); and "storing said one or more bit vectors and a reference to said one or
more candidate keyword strings in said database" (Li, Column 7, Line 1-3 and Li,
Figure 2, Store pointers to Lexicon Entries in Bucket Address Table 240).[10]

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[10] Office Action, at pp. 19-20.

The Applicants respectfully disagree. The arguments made above with respect to Claim 25 apply here as well.

Claim 29

With this Amendment, Claim 29 has been cancelled without prejudice or disclaimer, rendering the rejection of Claim 29 moot.

Claim 32

With this Amendment, Claim 32 has been amended to recite in part creating a *single* bit vector based at least in part on said input keyword string. (emphasis added) Thus, the arguments made with respect to Claim 1 apply here as well. Claim 1 being allowable, Claim 32 must also be allowable.

Claim 35

Claim 35 depends from Claim 32. Claim 32 being allowable, Claim 35 must also be allowable.

Claim 36

Claim 36 recites:

A method for creating a keyword string database on a wireless user device, the method comprising:
determining one or more candidate keyword strings to store in said database;
creating one or more bit vectors based at least in part on said one or more candidate keyword strings, each bit of said one or bit vector corresponding to one or more symbols in an alphabet, bits having a bit position corresponding to a symbol of a prefix of a word in said one or more candidate keyword strings being set, said one or more bit vectors for use in comparing an input bit vector with said one or more bit vectors to indicate whether an input

keyword string represented by said input bit vector matches said one or more candidate keyword strings; and

storing said one or more bit vectors and a reference to said one or more candidate keyword strings in said database.

The Examiner states:

> ... Welch in view of Li is directed to "a method for creating a keyword string database on a wireless user device" (Welch, Paragraph 0026, i.e., In further embodiments, the broadcast media receiver 10 and/or the wireless terminal 20 are configured to determine whether one or more keywords or other criteria are present in the textual data; Figure 1: 20) and teaches the limitations: "determining one or more candidate keyword strings to store in said database" (Li, Column 6 Line 40-50, i.e., valid lexicon strings (such as legal and correct city names).....); "creating one or more bit vectors based at least in part on said one or more candidate keyword strings" (Li, Column 6 Line 40 through Column 9 Line 35), "each bit of said one or more bit vector corresponding to one or more symbols in an alphabet, bits having a bit position corresponding to a symbol of a prefix of a word in said one or more candidate keyword strings being set" (Li, Column 6 Line 40 through Column 9 Line 35), "said one or more bit vectors for use in comparing an input bit vector with said one or more bit vectors to indicate whether an input keyword string represented by said input bit vector matches said one or more candidate keyword strings" (Li, Column 8 Line 51 through Column 9 Line 36); and "storing said one or more bit vectors and a reference to said one or more candidate keyword strings in said database' (Li, Column 7, Line 1-3, i.e., Signature Vector and Li, Figure 2: Store pointers to Lexicon Entries in Bucket Address Table 240).[11]

The Applicant respectfully disagrees. The arguments made above with respect to Claim 28 apply here as well. Claim 28 being allowable, Claim 36 must also be allowable for at least the same reasons.

Claim 37

Claim 37 recites:

A method for incremental keyword search on a wireless user device, the method comprising:

submitting an input keyword string comprising one or more words comprising one or more symbols; and

receiving in response to said submitting at least one candidate keyword string where a prefix of a word of a matching candidate keyword string comprises at

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[11] Office Action, at pp. 22-23.

least one symbol that belongs to the same symbol group as the corresponding symbol of the corresponding word in said input keyword string.

The Examiner states:

> ... Welch in view of Li is directed to "a method for incremental keyword search on a wireless user device" (Welch, Paragraph 0026, i.e., In further embodiments, the broadcast media receiver 10 and/or the wireless terminal 20 are configured to determine whether one or more keywords or other criteria are present in the textual data; Figure 1: 20) and teaches the limitations: "submitting an input keyword string comprising one or more words comprising one or more symbols" (Li, Column 6 Line 10-21, Column 6 Line 40 through Column 9 Line 35); and "receiving in response to said submitting at least one candidate keyword string where a prefix of a word of a matching candidate keyword string comprises at least one symbol that belongs to the same symbol group as the corresponding symbol of the corresponding word in said input keyword string" (Li, Column 8 Line 51 through Column 9 Line 36).[12]

The Applicant respectfully disagrees. The arguments made above with respect to Claim 18 apply here as well. Claim 18 being allowable, Claim 37 must also be allowable for at least the same reasons.

Claim 40

With this Amendment, Claim 40 has been amended to recite in part creating a *single* bit vector based at least in part on said input keyword string. (emphasis added) Thus, the arguments made with respect to Claim 21 apply here as well. Claim 21 being allowable, Claim 40 must also be allowable.

Claim 43

Claim 43 depends from Claim 40. Claim 40 being allowable, Claim 43 must also be allowable.

Claims 54, 73, 98, and 117

With this Amendment, Claims 54, 73, 98, and 117 have been cancelled without prejudice or disclaimer, rendering the rejection of these claims moot.

Claims 45, 46, 57, 60, and 61

Claims 45, 46, 57, 60, and 61 include limitations similar to Claims 1, 2, 13, 16, and 17 respectively. Claims 1, 2, 13, 16, and 17 being allowable, Claims 45, 46, 57, 60, and 61 must also be allowable.

Claims 62, 65, 68, 69, 70, 71, 72, 76, 79, 80, 81, 84, 87, 89, 90, 101, 104, 105, 106, 109, 112, 113, 114, 115, 116, 120, 123, 124, 125, 128, 131, 133, 134, 142, 145, 146, 147, 150, 151, 152, 153, 154, 155, 158, 159, 160, 163, 165, 166, 174, 177, 178, 179, 182, 183, 184, 185, 186, 187, 190, 191, 192, and 195

Claims 62, 65, 68, 69, 70, 71, 72, 76, 79, 80, 81, 84, 87, 89, 90, 101, 104, 105, 106, 109, 112, 113, 114, 115, 116, 120, 123, 124, 125, 128, 131, 133, 134, 142, 145, 146, 147, 150, 151, 152, 153, 154, 155, 158, 159, 160, 163, 165, 166, 174, 177, 178, 179, 182, 183, 184, 185, 186, 187, 190, 191, 192, and 195 include limitations similar to Claims 18, 21, 16, 25, 26, 27, 28, 32, 16, 36, 87, 40, 16, 1, 2, 13, 16, 17, 18, 21, 16, 25, 26, 27, 28, 32, 16, 36, 37, 40, 43, 1, 2, 13, 16, 17, 18, 16, 25, 26, 27, 28, 32, 16, 36, 40, 16, 1, 2, 13, 16, 17, 21, 16, 25, 26, 27, 28, 32, 16, 36, 40, and 16, respectively. Claims 18, 21, 16, 25, 26, 27, 28, 32, 16, 36, 87, 40, 16, 1, 2, 13, 16, 17, 18, 21, 16, 25, 26, 27, 28, 32, 16, 36, 37, 40, 43, 1, 2, 13, 16, 17, 18, 16, 25, 26, 27, 28, 32, 16, 36, 40, 16, 1, 2, 13, 16, 17, 21, 16, 25, 26, 27, 28, 32, 16, 36, 40, and 16 being allowable, Claims 62, 65, 68, 69, 70, 71, 72, 76, 79, 80, 81, 84, 87, 89, 90, 101, 104, 105, 106, 109, 112, 113, 114, 115, 116, 120, 123, 124, 125, 128, 131, 133, 134, 142, 145, 146, 147, 150, 151, 152, 153, 154, 155, 158, 159, 160, 163, 165, 166, 174, 177, 178, 179, 182, 183, 184, 185, 186, 187, 190, 191, 192, and 195 must also be allowable for at least the same reasons.

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[12] Office Action, at pp. 23-24.

The Second 35 U.S.C. § 103 Rejection

Claims 3-9, 47-53, 91-97, 135-141, and 167-173 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Li in view of Welch and further in view of Braun et al.[13] [14] This rejection is respectfully traversed.

Claims 3-9, 47-53, 91-97, 135-141, and 167-173 depend from Claims 1, 45, 89, 133, and 165, respectively, and thus include the limitations of claim 1, 45, 89, 133, and 165. The arguments made above with respect to claim 1 apply here as well. The 35 U.S.C. § 103(a) rejection of claim 1 based on Li in view of Welch is unsupported by the art, as each and every element as set forth in claim 1 is not found in Li in view of Welch. Therefore, the 35 U.S.C. § 103(a) rejection of dependent claims 3-9, 47-53, 91-97, 135-141, and 167-173 based on Li in view of Welch and further in view of Braun is also unsupported by the art. Thus, no prima facie case of obviousness has been established and the 35 U.S.C. § 103 rejection should be withdrawn.

The Third 35 U.S.C. § 103 Rejection

Claims 11-12, 14-15, 19-20, 22-23, 30-31, 33-34, 38-39, 41-42, 55-56, 58-59, 6364, 66-67, 74-75, 77-78, 82-83, 85-86, 99-100, 102-103, 107-108, 110-111, 118-119, 121-122, 126-127, 129-130, 143-144, 148-149, 156-157, 161-162, 175-176, 180-181, 188-189, and 193-194 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Li in view of Welch and further in view of Albornoz et al.[15] [16]

With this Amendment, Claims 11-12, 55-56, 99-100, 30-31, 74-75, and 118-119 have been cancelled without prejudice or disclaimer, rendering the rejection as to these claims moot.

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[13] U.S. Publication No. 2004/0064787 to Braun et al.
[14] Office Action at ¶ 10.
[15] U.S. Publication No. 2004/0260929 to Albornoz et al.

Regarding Claims 14-15, 19-20, 22-23, 33-34, 38-39, 41-42, 58-59, 63-64, 66-67, 77-78, 82-83, 85-86, 102-103, 107-108, 110-111, 121-122, 126-127, 129-130, 143-144, 148-149, 156-157, 161-162, 175-176, 180-181, 188-189, and 193-194, the arguments made above with respect to the independent claims apply here as well. The 35 U.S.C. § 103(a) rejection of claims based on Li in view of Welch is unsupported by the art, as each and every element as set forth in the independent claims is not found in Li in view of Welch. Therefore, the 35 U.S.C. § 103(a) rejection of dependent claims 14-15, 19-20, 22-23, 33-34, 38-39, 41-42, 58-59, 63-64, 66-67, 77-78, 82-83, 85-86, 102-103, 107-108, 110-111, 121-122, 126-127, 129-130, 143-144, 148-149, 156-157, 161-162, 175-176, 180-181, 188-189, and 193-194 based on Li in view of Welch and further in view of Albornoz et al. is also unsupported by the art. Thus, no prima facie case of obviousness has been established and the 35 U.S.C. § 103(a) rejection should be withdrawn.

The Fourth 35 U.S.C. § 103 Rejection

Claims 44, 88, 132, 164, and 196 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Li in view of Welch and further in view of Vagnozzi.[17][18] This rejection is respectfully traversed.

Claim 44

Claim 44 recites:

A method for incremental keyword search on a wireless user device, the method comprising:
receiving from a user of said wireless user device an input keyword string comprising one or more words comprising one or more symbols, each symbol representing the first symbol of a word in a search string;

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[16] Office Action at ¶ 11.
[17] U.S. Patent No. 6,499,033 to Vagnozzi.
[18] Office Action at ¶ 12.

receiving a hierarchy, elements of said hierarchy comprising intermediate nodes and leaf nodes representing one or more keyword strings comprising one or more words comprising one or more symbols;

creating hierarchy bit vectors corresponding to said one or more keyword strings in said hierarchy;

searching said hierarchy bit vectors for a match with said input keyword string, said searching comprising, for each of said elements of said hierarchy:

saving said input keyword string;

applying a logical "AND" operation to the bit vector of the element and a bit vector based at least in part on said input keyword string, said applying producing a result;

if said result is nonzero, removing from said input keyword string any words in said input keyword string that are prefixes of words in the element;

if said input keyword string is empty, adding said element to a list of matched items; and

restoring said input keyword string; and

rendering said list of matched items.

The Examiner states:

> ... Li in view of Welch is directed to a method for incremental keyword search, the method comprising, receiving an input keyword string comprising one or more words comprising one or more symbols, each symbol representing the first symbol of a word in a search string (Li, Column 8 Line 51 through Column 9 Line 36). However, Li does not explicitly disclose the limitation: "receiving a hierarchy, elements of said hierarchy comprising intermediate nodes and leaf nodes representing one or more keyword strings comprising one or more words comprising one or more symbols" and "searching said hierarchy bit vectors for a match with said input keyword string, said searching comprising, for each said elements of said hierarchy: saving input keyword; applying a logical "AND" operation to the bit vector of the element and a bit vector based at least in part on said input keyword string, said applying producing a result". On the other hand, Vagonzzi teaches a database method and apparatus using hierarchical bit vector index structure comprising: "receiving a hierarchy, elements of said hierarchy comprising intermediate nodes and leaf nodes representing one or more keyword strings comprising one or more words comprising one or more symbols" (Vagonzzi, Figure 2, Column 5 Line 44 through Column 6 Line 10, i.e. "The indexes 30 are actually collections of keys stored in a 13- tree."); "creating hierarchy bit vectors corresponding to said one or more keyword strings in said hierarchy" (Vagonzzi, Figure 2, Column 5 Line 44 through Column 6 Line 10, i.e. 'The indexes 30 are actually collections of keys stored in a B-tree.");); "searching said hierarchy bit vectors for a match with said input keyword string" (Vagonzzi, Column 10 Line 40 + , i.e. "Query Processing the Indexes"), "said searching comprising, for each of said elements of said hierarchy: saving said input keyword string; applying a logical "AND" operation to the bit vector of the element and a bit vector based at least in part on said input keyword string" (Vagonzzi, Column 11, Line 1-27, i.e. " .... then searches the appropriate index for those target keys, starting with the lowest key.....), "said applying producing a result" (Official Note:

a search always returns a result); "if said result is nonzero, removing from said input keyword string any words in said input keyword string that are prefixes of words in the element" (...If no key is found, a bit vector of all zeros is returned. If a matching key is found in the index, then the associated link is used to obtain a bit vector for that key...."); "if said input keyword string is empty, adding said element to a list of matched items" ((... If no key is found, a bit vector of all zeros is returned. If a matching key is found in the index, then the associated link is used to obtain a bit vector for that key...."); and "restoring said input keyword string; and rendering said list of matched items" (Vagonzzi, Column 11, Line 1-27). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the method and system which employ both bit vectors and a tree hierarchy as taught by Vagonzzi with the method and system of Welch in view of Li so that the combined method and system would accommodate bit vectors in a tree hierarchy and logical searches into the trees could be performed. One would have been motivated to do so in order to "provide a method and apparatus for managing large amounts of data in a manner that provides the following benefits: 1. Very fast query response; 2. Fast Update response; 3. Support for .... " (Vagonzzi, Column 3, Line 7-26).[19]

The Applicant respectfully disagrees. In the Response filed March 19, 2007, the Applicant argued that contrary to the Examiner's statement, the cited references do not disclose or suggest the limitations of Claim 44. In the Office Action mailed May 2, 2007, the Examiner does not address the merits of Applicant's argument. Again, contrary to the Examiner's statement, Li in view of Welch and further in view of Vagonzzi does not disclose or suggest receiving from a user of said wireless user device an input keyword string comprising one or more words comprising one or more symbols, each symbol representing the first symbol of a word in a search string. The arguments made above with respect to Claim 32 apply here.

Also contrary to the Examiner's statement, Li in view of Welch and further in view of Vagonzzi does not disclose or suggest said searching comprising, for *each* of said elements of said hierarchy ... saving said input keyword string. In support of the Examiner's contention, the Examiner refers to the following portion of Vagonzzi:

Query processing is implemented by computer 52 by way of microprocessor 54 executing instructions from database management program 64. Program 64

[19] Office Action, at pp. 28-30.

locates the one or more records that satisfies a particular user query by creating a target keys (e.g., c:0:blue) for each coarse and fine slice and then searches the appropriate index for those target keys, starting with the lowest key valued key (i.e., coarse slice 0). If no key is found, a bit vector of all zeros is returned. If a matching key is found in the index, then the associated link is used to obtain a bit vector for that key. If the link is of type 0, as shown in FIGS. 8 and 9, then the bit vector identified by the link is returned. Where one or both of the keys' links are of type 1; that is, they contain a relative fine slice number (in the case of a coarse key) or a relative record number (in the case of a fine key) rather than a pointer to a bit vector, then a bit vector is created and, for a fine bit vector, the bit corresponding to the record identified by the link is set to one and the remaining bits of the vector being cleared to zero. When creating a coarse bit vector (which includes both ANY bits and ALL bits), the ANY bit corresponding to the fine slice number identified by the link is set to one, with the remaining ANY bits being cleared to zero, and the ALL bit corresponding to the fine slice number identified by the link is set to the same value (0 or 1) as the ALL bit contained in the link, with the other ALL bits being cleared to zero. In this way, query processing can always be carried out using bit vectors, regardless of which type of link is stored in the index.[20]

Nowhere does the cited portion of <u>Vagonzzi</u> disclose for each of said elements of a hierarchy, saving an input keyword string.

Also contrary to the Examiner's statement, <u>Li</u> in view of <u>Welch</u> and further in view of <u>Vagonzzi</u> does not disclose or suggest said searching comprising, for *each* of said elements of said hierarchy ... applying a logical "AND" operation to the bit vector of the element and a bit vector based at least in part on said input keyword string. Nowhere does the cited portion of <u>Vagonzzi</u> disclose for each of said elements of a hierarchy, applying a logical "AND" operation to the bit vector of the element and a bit vector based at least in part on an input keyword string.

Also contrary to the Examiner's statement, <u>Li</u> in view of <u>Welch</u> and further in view of <u>Vagonzzi</u> does not disclose or suggest said searching comprising, for *each* of said elements of said hierarchy ... if said result is nonzero, removing from said input keyword string any words in said input keyword string that are prefixes of words in the element. Nowhere does the cited portion of <u>Vagonzzi</u> disclose for each of said elements of a hierarchy, if a search result is

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[20] <u>Vagonzzi</u> at col. 11 ll. 1-27.

nonzero, removing from an input keyword string any words in the input keyword string that are prefixes of words in an element.

Also contrary to the Examiner's statement, <u>Li</u> in view of <u>Welch</u> and further in view of <u>Vagonzzi</u> does not disclose or suggest said searching comprising, for *each* of said elements of said hierarchy ... if said input keyword string is empty, adding said element to a list of matched items. Nowhere does the cited portion of <u>Vagonzzi</u> disclose for each of said elements of a hierarchy, if an input keyword string is empty, adding the element to a list of matched items.

Also contrary to the Examiner's statement, <u>Li</u> in view of <u>Welch</u> and further in view of <u>Vagonzzi</u> does not disclose or suggest said searching comprising, for *each* of said elements of said hierarchy ... restoring said input keyword string. Nowhere does the cited portion of <u>Vagonzzi</u> disclose for each of said elements of a hierarchy, restoring an input keyword string.

<u>Claims 88, 132, 164, and 196</u>

Claims 88, 132, 164, and 196 include limitations similar to Claim 44. Claim 44 being allowable, Claims 88, 132, 164, and 196 must also be allowable for at least the same reasons.

<u>The Fifth 35 U.S.C. § 103 Rejection</u>

Claims 197- 206 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over <u>Li</u> in view of <u>Ronchi et al.</u>[21][22] This rejection is respectfully traversed. The arguments made above with respect to Claim 25 apply here as well. Claim 25 being allowable, Claims 197-206 must also be allowable.

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[21] U.S. Patent No. 6,496,836 to <u>Ronchi et al.</u>
[22] Office Action at ¶ 13.

In view of the foregoing, it is respectfully asserted that the claims are now in condition for allowance.

Conclusion

It is believed that this Amendment places the above-identified patent application into condition for allowance. Early favorable consideration of this Amendment is earnestly solicited.

If, in the opinion of the Examiner, an interview would expedite the prosecution of this application, the Examiner is invited to call the undersigned attorney at the number indicated below.
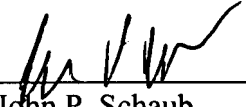
The Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Please charge any additional required fee or credit any overpayment not otherwise paid or credited to our deposit account No. 50-1698.

Respectfully submitted,

THELEN REID BROWN
RAYSMAN & STEINER LLP

Dated: September 4, 2007

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